



Community Environmental Advocates

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October 11, 2017

Mark Austin, Remediation Project Manager
New Jersey Remediation Branch
USEPA, Region 2
290 Broadway
New York, NY 10007-1866

RE: American Cyanamid Superfund Site
Bridgewater, New Jersey
Operable Unit 8 – Impoundments 1 & 2

Dear Mr. Austin:

CRISIS appreciates this opportunity to provide its views on remedy selection for OU 8, Impoundments 1 & 2 at the American Cyanamid Superfund site in Bridgewater, New Jersey. Please note that CRISIS has not seen or reviewed the Focused Feasibility Study (FFS) for OU 8, nor the alternatives being put forth to the Remedy Review Board by EPA Region 2 and by Pfizer/Wyeth Holdings. We did have the privilege of a presentation by EPA and Pfizer on May 31, 2017 on OU 8 at which several technologies and other relevant issues were discussed, for which we were most appreciative.

Without having access to the FFS, the remedial alternatives we reviewed and considered are based on our on-going meetings on OU 8 over the years with EPA, Pfizer and its consultants, as well as with prior Responsible Parties.

BACKGROUND ON CRISIS' INVOLVEMENT

CRISIS came into being in the 1980s to focus the community's concerns over objectionable plans for environmental management at the old American Cyanamid manufacturing facility.

- We have been the TAG holder for this Superfund site since 1993. Three current Board members of CRISIS, including the Executive Chairman, have sustained their roles since the startup of the TAG. (2 other early members no longer serve on the CRISIS Board, and the founding Executive Director stepped down in 2012). We have had two Technical Advisors over the 24 year life of CRISIS; our current Technical Advisor came on Board in 2012 in time for a presentation on the planned field pilot studies for Impoundments 1 & 2. CRISIS was a 2016 recipient of Region 2 EPA's Environmental Champion Award.

- CRISIS has a history of being proactive as necessary, and an effective facilitator of compromise when called for. Two examples of the role we played are:
 - We fought for the construction of a dedicated ground water treatment facility on the site as a result of the inability of the county SRVSA sewerage authority to fully treat Volatile Organic Compounds (VOCs) in ground water. This approach was agreed to by the Responsible Party and is now under construction by Pfizer.
 - It was CRISIS that suggested Alternative 4A that was incorporated into EPA's ROD for OU 4 in 2012. 4A was developed as a compromise between CRISIS' preferred Alternative 5 and EPA's Alternative 4.
- Much earlier in the process CRISIS supported an approach for OU 8 that incorporated bioremediation and thermal treatment. This proved to not be feasible and was dropped by EPA in the 2001 timeframe.
- CRISIS has worked independently throughout, cooperating with Bridgewater Township and the surrounding communities.

KEY PRINCIPLES CONSIDERED IN CRISIS' ANALYSIS

As EPA is aware, there is a set of complex issues to be evaluated in order to determine the most effective remediation approach in dealing with the very nasty chemical and physical properties of the waste material contained in Impoundments 1 & 2. Issues that CRISIS grappled with in forming and consolidating its recommendations resulted in our articulating these 5 principles:

1. ***Destruction of VOCs.*** The chemical composition of the waste contents of Impoundments 1 & 2 includes exceedingly high concentrations of Benzene and other VOCs. Having to deal with these highly toxic materials, as we see it, is problematic whether they are to be treated in situ, stabilized and transported elsewhere on the site, or moved off site and destroyed. Environmentally, we believe that these materials should be destroyed. However, it appears that thermal treatment of VOCs on site, if feasible at all, may come with an untenable set of hazards and dangers. Nevertheless, the destruction of the VOCs, if possible, would be our highest environmental priority.
2. ***Protection of the Raritan River.*** The Raritan River is an important natural resource in the Bridgewater/Central New Jersey region. Impoundments 1 & 2 are in close proximity to the river, and are situated in a highly vulnerable natural flood plain with a history of frequent and severe flooding. Final disposal in the flood plain of any waste from the site, no matter how it would be treated, would violate our sense duty toward protection and stewardship of the river and the citizens in affected communities.
3. ***Ground Water Protection.*** The ROD for OU 4, issued in 2012, is built upon the concept of remediating ground water at the site from both the overburden strata and the bedrock strata. The ROD for OU 8, scheduled for 2018, should be directed toward *further* protection of the ground water by preventing the leaching of VOCs and other contaminants into the underlying aquifers.
4. ***Long Term Solutions.*** CRISIS is a long standing advocate for our community, dedicated to sensible remedial actions that stand the test of time. We urge that all

remediation measures adopted for Impoundments 1 & 2 be long term in their objectives , and final (where possible) in their scope.

5. ***Final Destination of Impoundment 1 & 2 Waste Material.*** Conceptually, there are three possible outcomes as the final location of untreated, treated or destroyed waste material: 1) in-situ in Impoundments 1 & 2; 2) Elsewhere/upland on the American Cyanamid site; 3) Off-site. Permanent storage of treated or untreated waste in the flood plain would by far be the least desirable long term outcome.

CRISIS' ANALYTICAL APPROACH

Key members of the CRISIS Board have scientific and technical backgrounds, and have always approached their community advisory roles using analytical methods. We have looked at the issues associated with the OU 8 remedial alternatives in a matrix – like way as follows:

Horizontal Axis: Remedial Technologies – based on our understanding from meetings with EPA and Pfizer

Vertical Axis. Health, Safety and Environmental Impacts

REMEDIAL TECHNOLOGIES. Based on Pfizer's presentations and our May 31, 2017 meeting with the RP and with EPA, we have analyzed the impacts of two primary technologies (in situ thermal treatment [ITT], and in situ stabilization and solidification [ISS]) and several variations that were discussed, or which were projected by our analysis as something EPA was likely to consider. These are:

- In situ Thermal Treatment (ITT) – Presumed to indicate that thermal treatment would take place in-situ, but the resulting treated waste would be transported to a secure landfill upland on the property
- In situ Stabilization, Solidification and Disposal (ISS) – Solidification, stabilization and final disposal in situ protected by engineering controls and ground water monitoring systems
- In situ Stabilization and Solidification (ISS) - Solidification and Stabilization with the resulting waste residue transported to an upland secure landfill for final disposal
- Solidification and Stabilization thermally enhanced using steam (TEISS) (as tested following the field pilot studies at Impoundments 1 & 2)
- Mechanical Dewatering (MD) – Mechanical Dewatering and on site disposal. There was discussion of excavating the waste material in the impoundments, mechanically dewatering the waste, and disposing it on site at an upland secure landfill
- Mechanical Dewatering and Off-site Destruction (MD) – Mechanical Dewatering followed by transport off site to an out of state permitted and monitored cement kiln for total destruction
- No treatment – A conceivable alternative would be to not treat the waste in Impoundments 1 & 2 at all, but to construct engineering controls designed to withstand all conceivable floods on the Raritan River.

NOTE: CRISIS regards Mechanical Dewatering not as a treatment process but as mechanical conditioning of waste to facilitate transport or treatment.

HEALTH, SAFETY AND ENVIRONMENTAL IMPACTS. The key provision of the Code of Conduct of New Jersey's Site Remediation Reform Act (SRRRA) of 2009 reads as follows: "A Licensed Site Remediation Professional's **highest priority** in the performance of his professional activities shall be the **protection of public health and safety, and the environment**". CRISIS believes that for the American Cyanamid site, squarely within the heart of Central New Jersey, these are appropriate criteria for the selection of a remedy for the difficult residual waste present in Impoundments 1 & 2. While articulating the appropriate details of these criteria may be more difficult, CRISIS considered the following circumstances that reflect these criteria:

Health & Safety

- Direct and indirect health impacts on human receptors
- Direct and indirect safety and health impacts on workers conducting remedial activities
- Duration of remedial actions – generally the longer the remediation the greater the potential community impacts
- Certainty of ability to implement remedy – do additional pilot studies need to be conducted before having a final remedy determination?
- Destruction of VOCs or not – is there a risk of future health impacts by not destroying VOCs?

Environmental & Ecological

- Protection of Raritan River ecological viability in case of a failure of engineering controls
- Risk that areas of environmental and ecological impacts will be expanded as a result of Raritan River flooding
- Leaching of contaminants from VOCs not destroyed due to failure of landfill liners and/or other engineering controls
- Further degradation of ground water
- Failure of future permittees or operators of ground water remediation systems to maintain hydraulic control; perhaps by decisions to prematurely cease operation, or lack of adequate financial assurance to operate facility
- Hazards from a remedy that fails to destroy residual VOCs, likely due to an unforeseen natural or man-made disaster, leading to community exposure to volatile air emissions or other releases of contaminants

EVALUATION OF REMEDIAL ALTERNATIVES

Despite not having access to the Focused Feasibility Study, and to the analyses by Pfizer's consultants (who in general we think were excellent), CRISIS has qualitatively examined each presumed alternative remedial action. We express our judgments below with regard to those factors that we believe to be strongly positive in support or strongly negative in opposition of each technology:

Remedial Technology	Strong Positive	Strong Negative
Thermal – ITT	Destruction of VOCs	Worker safety risks Impact of acid waste on operating systems Difficulty in scaling up Will more testing be needed?
In Situ ISS and Disposal	Technically proven Can be completed relatively quickly	Leaching of VOCs Long term viability of engineering controls Needs perpetual monitoring Significant flood risks
ISS – Upland Disposal	Technically proven Quickly completed Disposal in secure landfill	Long term risk of leaching VOCs not destroyed
TEISS – Thermally Enhanced ISS	More effective than ISS in removing VOCs	Scaling up problems? Steam may be difficult to control Possible air emissions Long term leaching of residual VOCs VOCs not destroyed
MD - On Site Disposal	MD is proven technology (but is it <i>really proven</i> for this application?)	Will VOCs be released, if so – dangers to river, air quality? VOCs not destroyed Long term risk of leaching
MD – Offsite Destruction	Cement kilns are permitted and monitored Low direct impact on B'water community; low volume truck traffic VOCs are totally destroyed No leaching	Will additional studies be needed? Possible transport issues/accidents? No desire to burden other communities
No Treatment	Avoidance of releases by minimal handling of waste	Long term risk of leaching VOCs remain – not destroyed Flood hazard risks Failure of engineering controls Failure of monitoring systems Permanent monitoring needed

COMPARISON OF REMEDIAL ALTERNATIVES

Given our evaluation of each remedial alternative thought to be “on the table”, CRISIS looks at the Strong Positives and Strong Negatives associated with each alternative as a means of comparing or ordering the choices. These are our conclusions:

- **In situ Thermal Treatment (ITT)** continues to be of great interest to CRISIS because it is consistent with one of our Key Principles, destruction of VOCs. However, it is possible that concerns for worker safety and the technical difficulties associated with scaling up the process would limit the feasibility of utilizing this technology. Furthermore, we are concerned that consideration of ITT may result in a need for further testing of the process and therefore serious delay the outcome of the decision making process.
- **In situ Stabilization and Solidification (ISS)** is a proven technology that can be implemented more quickly than ITT. We see the potential for several variations of employing this process, including use of steam for VOC removal by thermal enhancement, with disposal of the solidified waste upland.
- **Mechanical Dewatering (MD)** appears to be a relatively new consideration. While a proven technology, we wonder whether it has been adequately tested under the conditions present in Impoundments 1 & 2. The apparent value of MD is to enable the waste to be transported elsewhere – on site or off site – where it can be further treated, destroyed or encapsulated. Removing the waste from the flood plain prior to any other actions, if effective, would be a strong positive for this approach. If additional studies are needed in order to justify this technology, the delay would be a significant drawback in the eyes of CRISIS.
- **No Treatment** would be the alternative that minimizes the handling of this onerous material. It would also likely be the least cost option, not directly of concern to CRISIS. However, the strong negatives associated with encapsulation with no treatment, including flood hazard risks and potential environmental damages lead CRISIS to believe there are better choices.

CRISIS' RECOMMENDATIONS

CRISIS urges EPA to consider the following recommendations:


- We are unable to judge the feasibility of In Situ Thermal Treatment in part due to safety concerns. If EPA believes that the ITT process originally considered is both feasible and safe, CRISIS would be receptive to the implementation of some version of this process since it would result in the destruction of VOCs.
- Reject any alternative that fails to treat the waste stored in Impoundments 1 & 2. In our opinion, this would not be protective of public health and safety, and the environment.
- Reject any alternative that would result in untreated OR treated waste remaining in Impoundments 1 & 2, or anywhere in the flood plain, regardless of engineering controls and/or long term monitoring. The long term presence of waste material in the flood plain is not protective; rather it is dangerous.


- Providing the Mechanical Dewatering process under consideration really works, with no unintended consequences in terms of releases of contaminants, we support its use to facilitate transport of the waste from the flood plain and treatment at another location.
- *CRISIS' preferred remedial solution for Impoundments 1 & 2 is destruction of the waste at an off-site permitted cement kiln, facilitated by on-site Mechanical Dewatering.*
- A less preferable but acceptable alternative is Stabilization and Solidification (ISS) with disposal at the upland on-site secured landfill.

We recognize that there may be other variations of the remedial alternatives that we have evaluated and commented on. We have done our best to provide you with our principles and priorities for the remediation of Impoundments 1 & 2 that may also be applied to other alternatives we have not specifically commented on. We trust that our recommendations and conclusions will be useful to EPA and to the Remedy Review Board. We also recognize that there will be at least one additional future opportunity for us to express our views with respect to EPA's forthcoming decisions on OU 8.

We have benefitted from EPA's and Pfizer's up-front communications with CRISIS, and look forward to a continued dialog with you prior to your issuance of the ROD for Impoundments 1 & 2, and hopefully during the implementation of remedies for OU 4 and OU 8. Knowing that the ground water remediation system for OU 4 is presently under construction is a reward for our members over many years for their efforts on behalf of the community. Please feel free to reach out to us as the remedy selection phase for OU 8 continues.

On behalf of the Board of Trustees of CRISIS


 Ross Stander
 Executive Chairman


 Ira L. Whitman, PhD, P.E.
 Technical Advisor